
सुरक्षा उपकरणों हेतु की-लॉक — विशिष्टि

Key Locks for Security
Equipment — Specification

ICS 13.310

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FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Security Equipment Sectional Committee, had been approved by the Mechanical Engineering Divisional Council.

Locks play a vital role in securing the valuables inside a security container like a safe or a fire resisting cabinet. This standard is used to test the ability of key locks to resist unauthorized opening of the key locks by manipulations. Key locks covered by these requirements may or may not have integral protection against entry by force in the safe or cabinet.

A product that contains features, characteristics, components, materials, or systems new or different from those covered by the requirements in this standard, and that involves a risk of fire, electric shock, or injury to persons shall be evaluated using the appropriate additional component and end-product requirements to determine that the level of safety as originally anticipated by the intent of this standard is maintained.

The composition of the committee responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

KEY LOCKS FOR SECURITY EQUIPMENT — SPECIFICATION

1 SCOPE

This standard specifies the general requirements and performance criteria for key locks for security equipment like but not limited to safes, strong room doors, safe deposit locker cabinets, etc.

2 REFERENCES

The standards listed in annex A contain provisions, which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards.

3 TERMINOLOGY

For the purpose of this standard following definitions may be referred.

3.1 Key Lock — Independent assembly normally fitted to doors of security equipment unit, which can be operated using one or more mechanical keys.

3.2 Dual Control Lock — A lock operable by two keys — one key operating main bolt and another key operating auxiliary bolt through the same keyhole.

3.3 Two Key Lock — A lock operable by two keys through two different key holes. This lock mandatorily needs two keys to open but only one key to close.

3.4 Cylinder Lock or Latch — Any lock or latch, the mechanism of which is contained in a cylinder.

3.5 Blank (Key) or Key Blank — A partly made key, which has been shaped to enter the keyhole of a certain type of lock or latch, but of which the blade (part of key that enters the lock) has not been finally notched to operate any individual lock.

3.6 Key — A small removable device for operating the mechanism of its own lock.

3.7 Double Bitted Key — Key with a bit on each side of the shank.

3.8 Keyhole — The hole into which the key enters to operate the lock or latch.

3.9 Key Steps or Key Depths — This term usually means the bolt step and lever steps of a key for a lever lock.

3.10 Bit (of Key) or Key Bit — That part of a key which is specially shaped or notched to operate the mechanism of its own particular lock or latch.

3.11 Bolt/Bolt Head — The part of a lock or latch which provides the fastening or engagement by protruding from the case to engage in the staple or with other member.

3.12 Bolt Stump — It is often described as a projection that is formed as part of the bolt. It acts as a fence to which the lever gates must be indexed and aligned prior to movement of the bolt.

3.13 Gating — The slot in a lever through which the bolt stump passes or goes into during the travel of the bolt or runner.

3.14 Auxiliary Bolt — It is an additional bolt used for locking the main bolt in thrown out position.

3.15 Lever — A flat shaped movable detainer in a lock, usually for the purpose of providing security and differs (combinations). The lever(s) in a lock have to be actually moved by the key to operate the lock.

3.16 Usable Combinations — Combinations of levers or pins permitted by the manufacturer and conforming to the requirements of this standard (For mechanical key lock the number of usable combinations is much less than the total number of theoretical combinations).

3.17 Destructive Burglary — Attack which damages the lock in such a manner that it is irreversible and can be detected during subsequent use.

3.18 Reliability — Ability to function and achieve intended security requirements of this standard after specified number of duty cycles.

3.19 Manipulation — Method of attack aimed at unlocking the lock (retracting the main bolt) without causing damage and not readily detectable during subsequent use.

3.20 Differs — Number of combinations possible by varying sequence of Levers, within which any one key will be able to open not more than one lock.

4 CLASSIFICATION

Key locks are classified as below.

4.1 Type A — Lever Lock

Grade	Active Levers (Minimum)	Key Control	Differs (Minimum)
A1	5	Single	2,000
A2	5	Dual	2,000
A3	8	Single	2,00,000
A4	8	Dual	2,00,000
A5	9	Single	8,00,000
A6	9	Dual	8,00,000
A7	10	Single	10,00,000
A8	10	Dual	10,00,000
A9	8	Double Bitted Single	2,00,000
A10	9	Double Bitted Single	8,00,000
A11	10	Double Bitted Single	10,00,000
A12	8	Double Bitted Dual	2,00,000
A13	9	Double Bitted Dual	8,00,000
A14	10	Double Bitted Dual	10,00,000

4.2 Type B — Two Key Lock

Grade	Active Levers (Minimum)	Key Control	Differs (Minimum)
B1	5	Two keys – Single Bit	2,000
B2	7	Two keys – Single Bit	40,000
B3	10	Two keys – Single Bit	10,00,000
B4	10	Two keys – Double Bit	10,00,000

4.3 Type C — Cylinder Lock

Grade	Active Pins (Minimum)	Rows of Pins	Key Control	Differs (Minimum)
C1	5	Single	Single	2,000
C2	7	More than one	Single	1,00,000
C3	7	More than one	Two keys	1,00,000
C4	8	More than one	Single	2,00,000
C5	8	More than one	Two keys	2,00,000

5 CONSTRUCTION

5.1 The lock shall be constructed so that it will operate only when the intended key or keys are used.

5.2 The product shall be constructed for installation in a position or location such that It does not reduce the burglary/fire resistant qualities of the security product on which it is being used.

5.3 For lock with sliding bolt, throw of the bolt shall be minimum 7 mm from unlocked to locked position. For locks with rotational bolt movement, rotation of the bolt shall be minimum 90 degrees from unlocked to locked position.

5.4 For Lever Type Lock

5.4.1 Minimum thickness of lever shall not be less than 1.2 mm nominal.

5.4.2 False (dummy) levers shall not be used.

5.4.3 Difference between gate of the lever and thickness of bolt stump in the direction perpendicular to bolt movement shall not be more than 1.0 mm.

5.5 The lock should not open by using a key having only one key cut different from the actual Key of that lock. Similarly, lock should not open with one depth difference of the design in lever, tumblers, or pin.

6 MATERIALS

Materials specified in Table 1 are for general guidance only. The critical quality parameters of the materials

used for the components shall be declared by the manufacturer at the time of type approval and records of details of material shall be maintained for conformity during routine production.

Table 1 Material for Lock Components
(Clause 6)

Sl No. (1)	Part (2)	Material (3)
i)	Body of lock, Bolts, Stump	Brass, cast brass, zinc based alloy, steel of any grade having ultimate tensile strength of 270 MPa, min
ii)	Lock lever	Brass sheet conforming to 4 and 6 of the requirements of copper and zinc and 7.1.3 of IS 410
iii)	Lever springs	Phosphor bronze wire of Grade II conforming to 5 and 6 to the requirements of tin, total impurities and copper of IS 7608 or any other material that meets endurance test as described in 8.1 of this standard
iv)	Keys	Stainless steel or any other non-ferrous metal/alloy

7 CORROSION PROTECTION

7.1 All parts of the lock shall be constructed of brass, bronze, zinc base alloy, stainless steel or corrosion-resistant materials or steel with protective finish.

7.2 All parts of the lock shall be able to comply with the salt spray corrosion test, as described in clause 8.3 of this standard.

8 PERFORMANCE TESTS

8.1 Endurance Test

8.1.1 A product shall be subjected to endurance test as indicated in table below.

Grade	No. of Cycles	Rate of Testing (Cycles/Minute)	No. of Breaks During Testing
A1 and A2	5,000	20 to 30	1
A3 to A6	20,000	20 to 30	2
A7 to A 14	30,000	20 to 30	3
B1 to B4	10,000	20 to 30	1
C1	5,000	20 to 30	1
C2 to C5	20,000	20 to 30	2

8.1.2 The lock shall withstand continuous number of cycles as mentioned against grade, at the rate indicated in table above. One operation shall constitute a cycle of one locking and one unlocking. the test shall be conducted with breaks as indicated in above table, by an automated machine, fitted with a calibrated counter.

8.1.3 At the end of the test, the lock shall function normally for 10 manual operations.

8.2 Bolt Forcing Test

8.2.1 Lock shall be fixed on a dummy surface using screws supplied with the lock as per manufacturer's instructions.

8.2.2 A load of 50 kg shall be applied on the bolt as shown in Fig. 1 for a period of 30 min. After removal of load, lock shall operate in normal manner.

8.2.3 Similarly a load of 50 kg shall be applied in the opposite direction of that specified in 8.2.2 for a further period of 30 min. After removal of load, lock shall operate in normal manner.

8.2.4 A load of 20 kg shall be applied on the bolt as shown in Fig. 2 for a period of 30 min on separate sample. After removal of load, lock shall operate in normal manner.

8.2.5 Similarly a load of 20 kg shall be applied in the opposite direction of that specified in 8.2.4 for a further period of 30 min. After removal of load, lock shall operate in normal manner.

8.2.6 A load of 5 kg shall be applied on the bolt as shown in fig. 3a for a period of 30 min on separate sample. After removal of load, lock shall operate in normal manner.

8.2.7 Similarly a load of 5 kg shall be applied in the opposite direction of that specified in 8.2.6 for a further period of 30 min (Fig. 3b). After removal of load, lock shall operate in normal manner.

8.3 Salt Spray Corrosion Test

8.3.1 All parts of the lock shall have corrosion resistant properties capable of withstanding exposure for 72 h in standard salt spray test with 5 percent salt solution.

8.3.2 Following the exposure, the locks are to be allowed to dry for 24 h in a room at ambient temperature.

8.3.3 At the end of the test, the lock shall function normally for 10 manual operations.

8.4 Key Strength

For testing the key strength, the lock shall be mounted in a stand according to Fig. 4. Then the correct key shall be fully inserted in the lock and rotated till the torque reaches 2.5 ± 0.1 Nm. Hold the key in same position with torque applied for a period of 10 ± 1 s. The key shall not bend, twist or break under the applied torque, so that the key shall be capable to be removed from the lock and reused to operate the same lock with a torque not exceeding 1.6 ± 0.1 Nm.

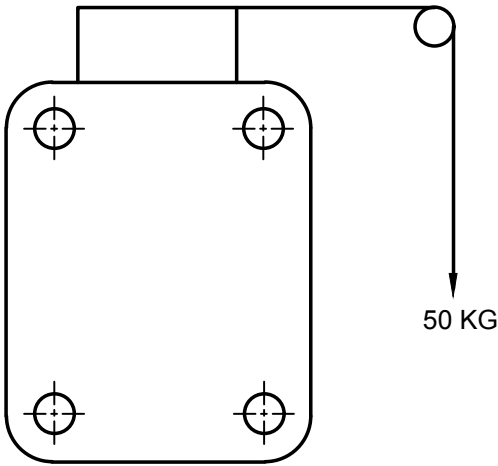


FIG. 1

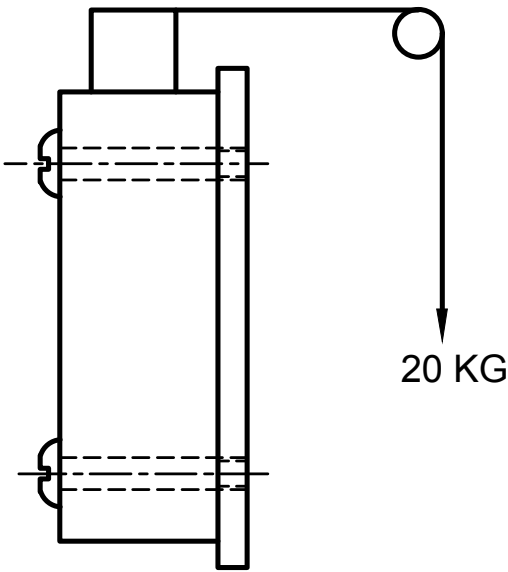


FIG. 2

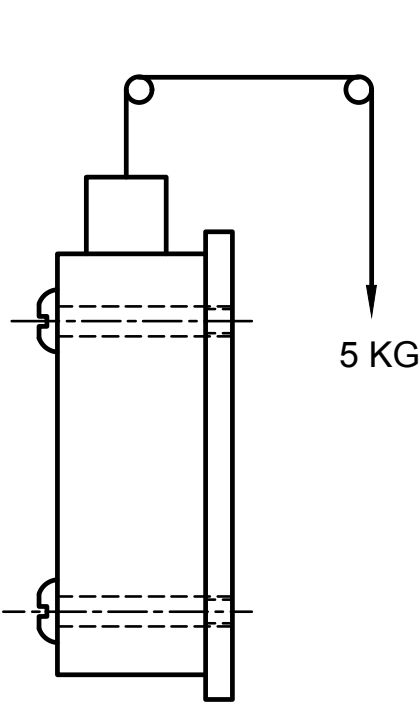


FIG. 3A

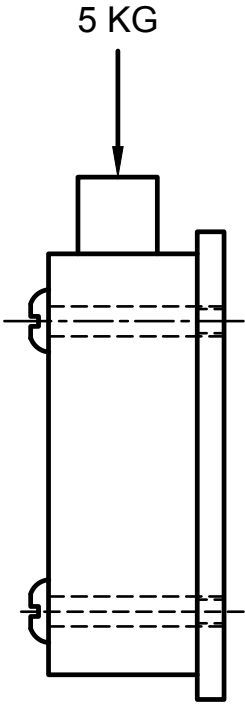


FIG. 3B

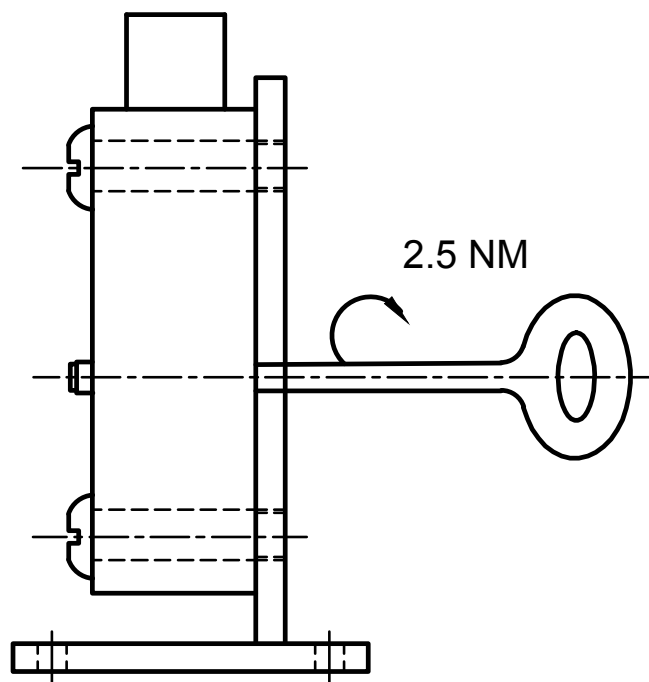


FIG. 4

9 MARKINGS

9.1 Marking on Lock

Sticker showing type and grade of lock together with manufacturer's name or logo, the year of manufacture and BIS Standard Mark, shall be stuck on outer surface of lock body with permanent glue.

9.2 Marking on Keys

The keys shall bear an identification number, which shall not be same as the serial number of the safe.

9.3 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

ANNEX A

(Clause 2)

LIST OF REFERRED INDIAN STANDARDS

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
410 : 1977	Cold rolled brass sheet, strips and foil	7608 : 1987	Phosphor bronze wire for general engineering purposes

ANNEX B*(Foreword)***COMMITTEE COMPOSITION**

Security Equipments Sectional Committee, MED 24

<i>Organization</i>	<i>Representative(s)</i>
Reserve Bank of India, Mumbai	SHRI D. K. RAGHU (Chairman)
Bank of India, Mumbai	CAPT AKHILESH KUMAR
Central Building Research Institute, Roorkee	DR SUVIR SINGH DR RAJIV KUMAR (<i>Alternate</i>)
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Guardwel Industries Private Limited, Mumbai	SHRI JOHN DMELLO SHRI LEON GEORGE (<i>Alternate</i>)
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Indian Overseas Bank, Chennai	CAPT P. VENKATESAN
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